

Appln No. 10/542,392
Amdt date May 2, 2008
Reply to Office action of November 2, 2007

REMARKS

Claims 1-8 are pending in the application. In the Office action dated November 2, 2007, the Examiner objected to certain aspects of the specification, namely, the listing of references, the use of an embedded hyperlink on page 68, and the form of the trademark SARAN. In addition, the Examiner rejected the claims on various grounds.

Applicants have amended the specification as indicated above by deleting the reference to the hyperlink and correcting the form of the trademark SARAN at several locations. Under separate cover, Applicants will file an updated information Disclosure Statement.

Applicants have amended claims 1 and 6 to put them in better condition for allowance. The amendment of claim 1 finds support in original claim 7. The amendment of claim 6 finds support in the specification at page 19, lines 16-26, and page 21, lines 7-10.

New claims 9-15 have been introduced, but no new matter has been added. Claims 9-11 find support in the specification at page 19, lines 23-30. Claims 12-13 find support in the specification at page 19, line 31, through page 20, line 22. Claims 14-15 find support in the specification at page 21, lines 10-15.

Applicants respectfully traverse all of the rejections and request reconsideration in view of the following remarks.

1. Rejection under 35 U.S.C. § 112, second paragraph.

Each of claims 2-5 depend from claim 1 and describe certain properties of the film element of the plant-cultivating device, namely, electrical conductivity, glucose permeability, peeling strength, and water impermeability (resistance to water pressure). These properties can be definitely measured according to methods set out in the present specification (see, e.g., pages 15-19), and these methods can easily be conducted by a person with ordinary skill in the art so as to provide accurate and reproducible values. Therefore, Applicants submit that, despite their form, claims 2-5 are definite, as their meaning can be readily ascertained from the specification.

Regarding claim 4, the unit for peeling strength is grams (g). Peeling strength is described in the specification, at page 18, line 22, through page 19, line 15.

2. General Remarks About the invention

The inventors have found that, when growing a plant in a nutrient fluid medium, such as a liquid containing a fertilizer component, it is beneficial to separate the plant's root from direct contact with the nutrient fluid. Thus, the supply of oxygen to the plant is separated from the supply of water and a fertilizer component. In one aspect of the invention, a device that enables a plant to be supplied with oxygen separately from the supply of water and fertilizer is provided. Claim 1 is representative. As amended, it recites:

1. A plant-cultivating device having a shape capable of receiving a plant body to be cultivated, comprising:
 - a film capable of being substantially integrated with the root of the plant body; and
 - supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film.

The device allows the plant to make effective use of oxygen in the air, without the problems associated with conventional nutrient fluid cultivation, such as the difficulty in supply of oxygen to the root, the need for strict control of the nutrient fluid, the possibility of contamination of the nutrient fluid from the root, and the possibility of contamination of the plant by pathogenic microorganisms in the nutrient fluid. In addition, by using the plant-cultivating device according to the present invention, it becomes very easy to place the plant to be cultivated under a water-suppressed condition so that the plant can be changed into a high-quality one (see the discussion in the specification, at page 86, lines 12-31).

Claim 6 describes a plant-film integrate:

6. A plant-film integrate, comprising:
 - at least a plant body and a film which has substantially been integrated with the root of the plant body, wherein the film comprises a non-porous hydrophilic film.

Claim 7 describes a method of cultivating a plant:

7. A plant-cultivating method, comprising:
- providing a plant-cultivating device having a shape capable of receiving a plant body to be cultivated, and comprising, as at least a portion thereof, a film capable of being substantially integrated with the root of the plant body; disposing the plant body in the device; and cultivating the plant body while allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film.

3. Rejection of claims 1-3 and 5-8 under 35 U.S.C. § 102(a) in view of Tonkin (US 6,615,537)

Tonkin discloses a method of collecting materials exuded from plant roots by growing the plant roots in a growing medium that is surrounded by a membrane, such that moisture is released into the growing medium from the membrane whilst materials exuded from the plant roots are retained within the growing medium by the membrane. The materials retained within the growing medium by the membrane are then collected.. As shown in Fig. 4 of the reference, deionized water is directly supplied to the roots of a plant. In Figs. 1-3 of the reference, tap water is supplied to the roots of a plant via soil. In Fig. 2 of the reference, the hydrophilic film 5 is used only for containing the soil 3.

Tonkin does not teach or suggest a plant-cultivating device comprising water supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film. Tonkin only uses deionized water or tap water containing no fertilizer component an no biologically active substance. Thus, Tonkin does not anticipate claim 1 of the present application, or any of the claims dependent therefrom.

Regarding claim 6, Tonkin does not teach or suggest the integration of a plant body and a film per se.

Regarding claims 7 and 8, Tonkin does not teach a method of plant cultivation utilizing a device having a shape capable of receiving a plant body to be cultivated, in which the device comprises, at least in part, a film capable of being substantially integrated with the root of the plant body; disposing the plant body in the device; and cultivating the plant body while allowing

water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film.

4. Rejection of claims 1 and 5 under 35 U.S.C. § 102(a) in view of Mori (EP 1 203 525)

Mori discloses a plant-cultivating container having a receiving portion for receiving a plant body; the container having, as at least a portion thereof, a selective moisture vapor-permeable portion that prevents water from passing through the selective moisture vapor-permeable portion, but allows water vapor to pass there through. In this reference, water is supplied to the roots of a plant in the form of water vapor (see paragraph [0114]). Accordingly, in Mori, it is clear that pure water containing no fertilizer component is supplied to the roots of a plant.

Thus, Mori does not teach or suggest a plant-cultivating device comprising water supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film. Mori does not anticipate claims 1 and 5.

5. Rejection of claims 6-8 under 35 U.S.C. § 102(a) in view of Wright (EP Appl. 0 268 556)

Wright discloses a plant culturing method comprising:

providing a plant growth interface means (11) including a membrane (10) that is substantially permeable to an aqueous plant nutrient medium (12) but substantially impermeable to plant roots and rootlets (151, 171, 191) and is made of a substantially water-insoluble and non-biodegradable material;

arranging a plant germinating means (13, 15) in the form of seeds or seedling plants on said plant contact surface (110);

maintaining said second surface (102) of said membrane (10) in contact with said aqueous medium (12) in liquid phase to induce formation of said superficial distribution; allowing said germinating means (13, 15) to grow into plants (17) of a predetermined stage of maturation on said interface means (11) and

separating said plants (17) from said interface means (11).

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Wright clearly uses a porous film (column 6, lines 18-27), and such a porous film cannot be integrated with a plant. In particular, a solution containing a fertilizer component or a biologically active substance *can freely pass* through the porous film, and accordingly, the plant placed in contact with the porous film can easily absorb the solution containing a fertilizer component or a biologically active substance. As a result, the plant cannot be integrated with the film.

Wright does not teach or suggest a plant-cultivating device having a shape capable of receiving a plant body to be cultivated, wherein the device comprises a film capable of being substantially integrated with the root of the plant body and water supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film. Therefore, Wright does not anticipate claims 6-8. In addition, regarding claim 6, Wright does not teach or suggest the use of a non-porous film, and does not teach a plant-film integrate. Nor does Wright teach the plant cultivation method recited in claim 7, for the reasons noted above.

6. Rejection of claim 4 under 35 U.S.C. § 103(a) in view of Tonkin (US 6,615,537)

As noted above, Tonkin does not teach or suggest a plant-cultivating device comprising water supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film. Tonkin only uses deionized water or tap water containing no fertilizer component an no biologically active substance. Thus, regardless of Tonkin's disclosure of a polyvinyl alcohol film, Tonkin would not lead the skilled person to the invention recited in Applicant's claim 4.

7. Rejection of claim 5 under 35 U.S.C. § 103(a) in view of Mori (EP 1 203 525)

As noted above, Mori does not teach or suggest a plant-cultivating device comprising water supply means for allowing water containing a fertilizer component or a biologically active substance to be contacted with the plant body through at least the film. Thus, Mori would not lead the skilled person to the invention recited in Applicant's claim 5, all the more so because of the different water impermeability recited in the reference (30cm or more, as compared to Applicant's 10cm or more).

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Fore the foregoing reasons, Applicants traverse the rejections. Reconsideration and a Notice of Allowance are earnestly requested.

Respectfully submitted,

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